Department of Development Services
Building Division
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Ronald L. Lynn, Director/Building Official

SUBJECT: TG-23-2008 PROJECT AUDITS OF QUALITY ASSURANCE AGENCIES

1.0 PURPOSE. This guideline provides the standards by which quality assurance agencies will be measured for their compliance with applicable codes and technical guidelines.

2.0 SCOPE. This guideline sets forth criteria for the auditing of quality assurance agencies.

3.0 ABBREVIATIONS AND ACRONYMS

APPROVED: Plans, revisions and specifications issued for permit by the Building Official

BAC: Clark County Building Administrative Code (Chapter 22.02, Clark County Code)

CCDDS-BD: Clark County Department of Development Services – Building Division

IBC: International Building Code

QAA: Quality Assurance Agency

TG: Technical Guideline

4.0 REFERENCES

International Building Code – Current adopted edition as amended
Clark County Building Administrative Code
TG-16, TG-16R, TG-20, TG-21

Approved Date: February 1, 2008
Effective Date: March 1, 2008

Revised By:	Concurred By:	Approved By:
/s/	/s/	/s/
Brenden Scherr, P.E. Senior Engineer	John S. Telford, P.E. Principal Engineer	Theodore L. Droessler, P.E. Engineering Manager

5.0 RESPONSIBILITIES

5.1 Special Inspection Audits: Clark County Department of Development Services, Building Division (CCDDS-BD) shall periodically audit Special Inspection activity on projects where a Building Permit, requiring a Quality Assurance Agency (QAA) agreement, has been issued by the Building Official. Special Inspection audits of these projects shall be provided by CCDDS-BD-Engineering Services group, hereby referred to simply as Engineering Services.

5.2 Audit Objectives: Engineering Services will monitor the effectiveness of the special inspection program by conducting audits of the assigned QAA at unannounced, variable times. Audits are comprehensive in nature seeking to evaluate the ability of a QAA to manage its quality program, supervise its employees, and technically assess the work under contract. Audits may also be used to assess the job performance of special inspectors.

5.3 Special Inspection Standards: Standards for QAA's and special inspectors are found in the above referenced Clark County Technical Guidelines (TG's) and expanded as follows:

5.3.1 The Special Inspector shall report to the job sufficiently in advance of construction to become familiar with the plans, specifications, and inspect all materials to be used or concealed within such work. The Special Inspector will observe the work and determine if it complies with the approved plans and specifications. The Special Inspector is required to furnish timely, written notification for all non-compliant items encountered. The Special Inspector shall also provide written reports for violations of the adopted code, approved plans and supporting documents.

5.3.2 Work requiring continuous special inspection shall occur only when the special inspector is present to observe the work. The QAA is responsible to the owner for staffing levels to ensure compliance with this requirement.

5.3.3 A Special Inspector is responsible for oversight of a contractor's work for compliance with the approved plans and specifications. All reports must document sufficient information that can be used to make this evaluation an objective process. The term "As per approved plans and specifications" will not be used as a catch-all phrase; reports must be constructed in an explicit manner with sufficient information to describe what was physically inspected or taking place. The terminology "As per Approved Plans" should only be used when an assemblage of individual previously reported referenced inspections culminate in a specific definable building component, and then only to indicate that such portion of the work has been completed.

5.4 Special Inspector Responsibilities:

5.4.1 It is the responsibility of the Special Inspector to understand the technical requirements of the approved plans and evaluate if there is sufficient clarity in the documents to successfully perform the inspection. Where ambiguities occur in the approved plans, the Special Inspector shall diligently pursue the required information. The Special Inspector is entitled to request and receive responses to inquiries from the permit holder regarding ambiguous, incomplete, or erroneous documents. The Special Inspector shall thoroughly review the approved plans prior to the installation of the work. All observations and inspections by the Special Inspector documented in the report file shall indicate that sufficiently clear information was furnished.

5.4.2 The Special Inspector is responsible for notifying his/her supervisor if the technical aspects of the work exceed his/her knowledge and experience. It is the responsibility of the QAA to assign a competent Special Inspector for the project.

5.4.3 The Special Inspector shall maintain copies of all inspections and laboratory reports at the job site until all special inspection and/or testing is complete.

6.0 PROCEDURE

6.1 Audit Procedure: Engineering Services will conduct project audits using the forms found in the attachments to this TG. Engineering Services will provide only one or two day's notice to the permit holder or QAA prior to the audit. The Special Inspector's supervisor may accompany the auditor. All inspection, monitoring and construction discrepancies noted during the audit will be included in the audit findings. The QAA will acknowledge audit findings and respond to Engineering Services in writing in a plan to resolve any outstanding issues discovered during the audit.

6.2 Audit Scope: The scope of the QAA project audit may include, but not be limited to, the following: inspector copy of the QAA firm quality assurance manual; document control procedures, copies of all field inspections, control of test specimen sampling, fabrication, handling, storage, packaging, preparation for shipping and shipping; field testing, welder qualification/certification records, and certifications for off-site fabricated product approvals and inspection records. The audit includes all items listed on the QAA agreement. The auditor shall review completed construction and the inspections performed on that work and its relationship to current and future work. Critical attention will be given to connections of all types and the details related to those connections.

7.0 RECORDS: The QAA Quality Manager shall maintain a copy of the audit for a period of two years. CCDDS-BD will maintain a copy for two years.

8.0 ATTACHMENTS

8.1 Audit Checklist
8.2 Audit Follow-Up
8.3 Field Testing Audits
8.3.1 Slump of Portland Cement Concrete
8.3.2 Sampling Fresh Concrete
8.4.3 Making and Curing Concrete Test Specimens in the Field

9.0 REVISION HISTORY

Title	Revision/Approved Date	Effective Date
TG-23-08	February 1, 2008	March 1, 2008
TG-23-07	May 25, 2007	June 01, 2007
TG-23-06	May 25, 2006	June 01, 2006

Project name:_____

Address:_____

Permit No(s):_____

Date:_____

Audit conducted by:_____

Special inspector name:_____

Date of last audit:_____

AUDIT CHECKLIST

ITEM#	ITEM REVIEWED	YES	NO
1.	Are the following fundamental requirements in compliance with Clark County procedures?	_____	_____
	A. Has a building permit been issued and correctly identified for the construction being inspected?	_____	_____
	B. Do projects with more than one building/permit number show the permit/building number(s) that apply to the area being inspected? Are the building address and permit number (s) recorded on the daily report?	_____	_____
	C. Have approved drawings been issued and identified by date for the construction being inspected as shown in the report?	_____	_____
	D. Are all reports signed and in numerical sequence?	_____	_____
	E. Is a special inspections agreement available at the job site?	_____	_____
	F. Has a special inspection job file been established?	_____	_____
	G. Are building pad certifications available in the project file?	_____	_____
2.	Is the location of the inspection identified by the approved plan sheet?	_____	_____
3.	Is all information legible, correct, free of ambiguity and complete?	_____	_____
4.	Do reports encompass all portions of the work?	_____	_____
5.	Are correct drawing numbers and detail references used for each inspection?	_____	_____
6.	Is information contained in drawings correct and free of ambiguity or personal interpretation?	_____	_____

ITEM#	ITEM REVIEWED	YES	NO
7.	Is sufficient information, details, etc., available to make the inspection?	_____	_____
8.	Have non-compliances been written, numbered and distributed?	_____	_____
9.	Have all inspections been made and all non-compliances resolved?	_____	_____
10.	Have all drawings, sketches and letters with engineering changes pertaining to special inspections been stamped and signed by the engineer of record?	_____	_____
11.	Have revised drawings, sketches, etc., which have been used to make inspections been correctly identified by date on stamp of Clark County approval when report was written?	_____	_____
12.	When required, has testing of structural components been performed and accepted by the special inspector?	_____	_____
13.	Has the engineer-of-record addressed all unsatisfactory test results for installed material not meeting approved specifications?	_____	_____
14.	Has the inspector referenced in his report the results of any specific construction procedures or techniques, which were necessary to ensure an acceptable inspection?	_____	_____
15.	Has the inspector verified the types and grades, member and size of building components?	_____	_____
16.	Have all structural steel components been furnished by a Clark County Listed Fabricator and accompanied with a Certificate of Compliance?	_____	_____
17.	Have qualifications of personnel performing structural field welding been verified and accepted prior to commencement of work?	_____	_____
18.	For special inspection items such as post-tensioned slabs, fireproofing, etc., have forms been used for the tabulation of results, which are specifically designed for that purpose and is the form fully functional?	_____	_____
19.	Have all items requiring special inspection per the QAA agreement either been inspected or reported as not requiring inspection?	_____	_____
20.	Does the job file contain a summary report for each completed assigned inspection element stating that the work was to the best of his/her knowledge performed in conformance with the approved plans and specifications?	_____	_____
21.	Did the contractor notify the testing/inspection agency in a timely manner when their services were required?	_____	_____
22.	Did County monitoring personnel note and discuss observed discrepancies in inspection and/or construction during their visit(s) to the job site?	_____	_____
23.	Are all testing/inspection agency personnel performing special inspections on this project approved for each specific inspectable item by CCDDS-BD?	_____	_____

ITEM#	ITEM REVIEWED	YES	NO
	this project approved for each specific inspectable item by CCDDS-BD?		
24.	Are inspection reports current with the work in progress?	_____	_____
25.	Do monitoring reports adequately describe project construction and special inspection for the project?	_____	_____
26.	Are other special inspection elements described by their own characteristics; i.e., height, width, depth, lift, and placement location, recorded?	_____	_____
27.	Are lap splices for reinforcing referenced to the source of information; i.e., plans, code, tables, schedules and/or plan notes as applicable?	_____	_____
28.	Are all related documents such as non-conforming item reports, resolution of non-conforming item reports, testing and/or inspection results, changes to plans and specifications, etc., referenced in the Daily Report with sufficient information to ensure traceability?	_____	_____
29.	Do all special inspectors follow the established form of report sequence numbering for all daily reports?	_____	_____

Audit follow-up: Engineering Services will review the QAA response to the audit report as follows:

1. Were deficiencies noted in the verification report addressed?_____
2. Were noted discrepancies reviewed by supervisor?_____
3. Were corrective measures taken?_____
4. Were corrective measures taken in line with the discrepancies noted?_____
5. Were corrective actions implemented?_____
6. Was a follow up made by the division monitor and special inspection supervisor to evaluate corrective measures?_____
7. Was additional training recommended?_____
8. Was additional or closer supervision recommended?_____

FIELD TESTING AUDITS

The following section contains audit forms to be used in evaluating testing technician performance in the field.

SLUMP OF PORTLAND CEMENT CONCRETE

1. Was sample of concrete obtained in accordance with ASTM C-172?_____
2. Sample placed on a flat, rigid nonabsorbent surface?_____
3. Mold smooth and free from projections and dents?_____
4. Tamping rod 5/8 "dia.?_____Hemispherical tip 5/8"rad_____
5. Mold dampened before test?_____
6. Mold filled in three equal volume lifts?_____
7. Concrete heaped above mold for final layer before rodding?_____
8. Each layer rodded 25 times?_____
   Strokes spiraled from outside toward center?_____
   Strokes just penetrating layer below?_____
9. Struck off by screeding and rolling?_____
10. Mold raised immediately in 5 +/- 2 secs?_____
11. Slump measured and recorded to nearest 1/4"?_____

SAMPLING FRESH CONCRETE

1. Time between first and final portions of sample 15 min max.?_____
2. Portion samples remixed with a shovel to uniform consistency?_____
3. Slump and Air tests begun within 5 min after sampling?_____
4. Strength test started within 15 min. after mixing composite sample?_____
5. Sample protected from sun and wind to prevent evaporation and contamination?_____
6. Strength sample 1 cu. ft. minimum?_____
7. Truck ticket check for correct mix?_____
8. Sample taken from two or more regularly spaced intervals during discharge of middle portion of the batch?_____
9. Was water added to the mix after samples obtained?_____

MAKING AND CURING CONCRETE TEST SPECIMENS IN THE FIELD

1. Strength samples molded on a level, rigid, horizontal surface? _____
2. Samples moved to the place of storage immediately after being struck off? _____
3. Samples protected from jarring, striking, tilting or scarring during movement to storage?_____
4. Sample placed in the mold such that a symmetrical distribution of the concrete obtained in the mold? _____
5. Concrete placed into the molds in equal volume layers?_____
6. Each layer rodded 25 times using a spiral outside to inside pattern penetrating the layer below; 4" lift, ½; more than 4", 1"?_____
7. Rodding voids closed by lightly tamping the mold sides with the tamping rod?_____
8. Samples struck off and initially cured at a temperature of 60 to 80 degrees during first 24 hours after molding?_____